

U.S. Patent Application

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CERAMIC METALLIC LIQUID HOLDING VESSEL

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CROSS REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application No. 60/515,167, filed October 27,
10 2003, and having the same title and inventor(s) as above.

FIELD OF THE INVENTION

The present invention relates to double walled
15 vessels that hold liquid and other substances. Vessels of the present invention are well suited for use in drinking, serving, or storage, among other tasks. More specifically, the present invention relates to double walled vessels that employ an outer ceramic wall and an inner metallic
20 wall.

BACKGROUND OF THE INVENTION

Ceramic vessels that are useful in holding liquid are known in the art. These include tea cups, coffee mugs,
25 casserole dishes and serving trays, among other items. Disadvantageous aspects of ceramic vessels include that they chip or break relatively easily, provide little insulation and tend to stain with use.

Double walled vessels are also known in the art.
30 These include stainless steel on stainless steel vacuum sealed vessels, stainless steel on plastic vessels and plastic on stainless steel vessels, among others.

Disadvantageous aspects of stainless steel on stainless steel (metal on metal) vessels includes that they are relatively expensive and difficult to print on. This is also true of stainless steel on plastic vessels
5 (particularly with respect to printing). While a metal exterior may appear smooth and appealing, the ability to print on a surface is very important to add aesthetic aspects or to associate a vessel with a particular company or individual. For example, the sale or give away of
10 printed coffee mugs and the like is an important part of the marketing efforts of many entities.

With respect to plastic on metal vessels, the plastic exterior may provide a more printable surface than stainless steel or permit insertion of a printed substrate
15 between a transparent plastic outer shell and a metallic liner. Plastic on metal vessels are disadvantageous, however, in that they are generally perceived as looking "cheap," printing wears off the plastic shell during use and washing, they tend not to be dishwasher safe and tend
20 to develop leaks or cracks between the plastic and metal. In addition, due to their fabrication process, the shape into which plastic may be shaped is limited without employing prohibitively expensive molds and fabrication techniques.

25 A need thus exists for a liquid holding vessel that provides good insulation, is relatively inexpensive to produce, that when printed on holds the printed text or image, and that is aesthetically pleasing, among other desired attributes.

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SUMMARY OF THE INVENTION

The present invention overcomes the shortcomings of the prior art and provides other benefits with a double

walled vessel having a ceramic outer wall or "shell" and a metal inner wall or "lining." The metal inner wall may lip over the top and/or a metal piece may be provided on the bottom of the ceramic shell to reduce chips and breaks,
5 and potentially provide an aesthetic component. The ceramic and metallic materials may be gapped to provide insulation.

The metallic inner wall is a good thermal conductor (e.g., conducts the temperature of a beverage to the lips
10 of a user), resists stains and is generally regarded as being easier to clean and sanitize. The ceramic shell provides an exterior surface that may be readily printed upon, that holds printing exceptionally well and when combined with stainless steel or like substances produces
15 an elegant look.

Ceramic and metallic liquid holding vessels in accordance with the present invention may be configured as cups, bowls, plates, jars, trays, etc., for drinking, serving, storage or other purposes. They may be configured
20 as resealable or non-resealable containers, and may find use in restaurant, household, laboratory, industrial or other environments.

These and related objects of the present invention are achieved by use of a ceramic metallic liquid holding
25 vessel as described herein.

The attainment of the foregoing and related advantages and features of the invention should be more readily apparent to those skilled in the art, after review of the following more detailed description of the
30 invention taken together with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a cross-sectional view of one embodiment of a ceramic-metallic double walled liquid holding vessel in accordance with the present invention.

5 Figs. 2-4 are a cross-sectional side view, an exploded side view and a top view, respectively, of another embodiment of a ceramic-metallic double walled liquid holding vessel in accordance with the present invention.

10 Figs. 5-7 illustrate yet other embodiments of a double walled liquid holding vessel in accordance with the present invention.

DETAILED DESCRIPTION

15 Referring to Fig. 1, a cross-sectional view of a ceramic-metallic double walled liquid holding vessel 10 in accordance with the present invention is shown. Vessel 10 may include an inner wall or "lining" 12 that is preferably formed of a metallic material. Stainless steel
20 is a suitable material, among others. Desirable characteristics of stainless steel include that it is durable, stain resistant, readily sanitizable (i.e., lends itself to a high degree of cleaning) and generally regarded as providing an elegant look. Alternative
25 metallic materials include, but are not limited to, aluminum, titanium, cast iron, alloys thereof, and other food-safe metals.

Vessel 10 may also include an outer shell 14 that is preferably formed of a ceramic material. The ceramic
30 material may include any non-metallic mineral whose formation procedure involves firing. Specific examples include earthenware, porcelain, stoneware and glass, though the present invention is not limited to these

materials. Ceramic materials and formation techniques are known in the art. In one embodiment of the present invention, porcelain is used to fabricate shell 14.

In the embodiment of Fig. 1, lining 12 is inserted
5 into shell 14. The top portion of lining 12 includes a flange or lip 11 that curves downward over the top edge 15 of shell 14. A gasket device 16, such as a silicone O-ring or another suitable device, may be provided between the top edge of the shell 14 and lining 12. The O-ring
10 preferably creates an air and water tight seal.

While the shell and lining may be angled from vertical, shell 14 may include a collar 17 that has less of an angle from vertical, thereby creating a gap 18 between the shell and lining. Note that other
15 configurations may be employed to form gap 18, including a circumferential bend in the metallic lining that reduces the lining diameter and/or a ledge formed in the interior face of the ceramic shell that spaces the shell from the lining, etc. Gap 18 may be an air gap or be filled with
20 insulating material. Suitable insulating material such as insulating foam is known in the art. While gap 18 is optional, the separation of the metallic lining, a good thermal conductor, from the ceramic shell, a poor thermal conductor, provides insulation.

25 In one embodiment, gap 18 is 3mm, lining 12 is 0.45mm and ceramic shell 14 is 2.6mm. The thickness of the gap may vary from 0mm to 10mm or more. The thickness of stainless steel material is preferably that of standard stainless steel linings, for example, of the type used in
30 plastic on metal double walled vessels and may vary as known in the art. The width of the ceramic material may vary as appropriate for a given container shape and function or ceramic material type. The added structural

strength of the metallic lining may permit the use of thinner ceramic walls than would typically be provided in the absence of such structural reinforcement, and vice versa.

5 The shell and lining are preferably configured relative to one another such that bottom portion 19 of the lining is positioned proximate a substantially complementary shaped portion of the shell. A plastic disk 24 may be provided on the underside of bottom portion 19.
10 This disk may have a threaded metal member or other threaded or non-threaded fastener receiving member into which fastener 34 is inserted.

 A metallic or non-metallic base plate 28 may optionally be provided at the bottom of shell 14. The base
15 plate may have a lip or side walls 29 that extend upwardly on the outside of shell 14. The shell may have a recess 26 at side walls 29 such that the side walls are substantially flush with the exposed exterior face of the shell when the base member is mounted. Lining bottom
20 portion 19 may be joined to base plate 28 by a screw 34 or other suitable fastener provided through hole 31 (formed in the ceramic material of the shell). Screw 34 essentially secures the lining to the shell.

 A pad 32, formed of rubber, plastic, cork, or other
25 suitable material, may be provided under base plate 28 to reduce skidding, etc. Base plate 28 may include a recess to accommodate pad 32.

 The flange or lip 11 on the top of the ceramic material and the base plate 28 on the bottom of the
30 ceramic material form a protective barrier that helps prevent chipping of the ceramic material. The flange on top also conducts the temperature of a beverage to the lip of a user.

While the use of screw 34 is one method of fixedly securing lining 12 to shell 14, it should be recognized that the lining and shell may be secured by other methods. One of these other methods is gluing. Glue may be applied
5 at the top intersection (between flange 11 and top edge 15) and/or the bottom intersection (between bottom portion 19 and the interior bottom of the shell) of these two materials. Another securing method is compression fitting and/or folding or crimping of the metallic material onto
10 the ceramic material. Yet another securing method is producing the ceramic material and metallic material with corresponding threads, and threading them onto one another. Note that some or all of these methods may be used in together.

15 For example, in the embodiment of Fig. 1, flange 11 may be compression fit onto top edge 15, while screw 34 may hold the lining within the shell and glue may join pad 32 to base plate 28.

Referring to Figs. 2-4, a cross-sectional side view,
20 an exploded side view and a top view of another embodiment of a ceramic metal liquid holding vessel 110 in accordance with the present invention is shown. Vessel 110 is different from vessel 10 in that the ceramic shell does not have a bottom. The shell 214 terminates on the bottom
25 end proximate base member 128. The lining 112 may be provided in a manner similar to lining 12 of Fig. 1, and the other components: lip 111, seal member 116, gap 118, fastener base 124 (here shown "clipped" or pressure fit around a bottom circumferential protrusion 117), side
30 walls 129, non-skid pad 132 and fastener 134 may be made as and may function as their counter parts in Fig. 1.

Fig. 3 illustrates an exploded view of vessel 110 of Fig. 3. Lining 112 fits into shell 114 such that lip 111

fits into recess 113 in shell top 115. The shell in turn is seated into base member 128 such that side walls 129 seat into circumferential recess 126. Fastener receiving member 124 is coupled to the lining and fastener 134
5 secures the base member, shell and lining. A handle 135 may be formed integrally with or added to shell 214 or be otherwise affixed to vessel 110 or other vessels herein.

Fig. 4 is a top view of vessel 110. The top lip 111, lining 112, lining bottom 119 and handle 135 are visible.

10 Referring to Fig. 5, a perspective view of another embodiment of a double walled drinking vessel 210 in accordance with the present invention is shown. Vessel 210 may include a metallic lining 212 similar to lining 12, a ceramic shell 214 similar to shell 14 and a base member
15 228 similar to base member 28. Vessel 210 presents a mildly fluted shape and has a handle 235. Vessel 210 may be constructed as described herein.

Referring to Fig. 6, a side view of another embodiment of a double walled drinking vessel 310 in
20 accordance with the present invention is shown. Vessel 310 is a bowl that may be used from serving, mixing, storage or eating out of, etc. Vessel 310 may include a metallic lining 312 with lip 311, a ceramic shell 314, and a base member 328.

25 Referring to Fig. 7, a side view of yet another embodiment of a double walled drinking vessel 410 in accordance with the present invention is shown. Vessel 410 is a resealable storage container. It may serve as a cookie jar, a flour or sugar jar, a place to store
30 sanitized medical instruments, among other applications. Vessel 410 includes a ceramic shell 414, a metallic lining (only lip 411 of which is visible) and a lid 437. Note that vessel 410 does not have side walls (such as side

walls 29 of vessel 10, though these could be provided). Fig. 7 illustrates one of many possible design variations in this regard. Bowl 310 of Fig. 6 and storage container 410 of Fig. 7 may be manufactured as discussed herein.

5 It should be recognized that merely a few embodiments are discussed with reference to the figures, the present invention may take any of various other forms. For example, several components of the embodiment of Fig. 1 may be excluded without deviating from the present
10 invention.

 The present invention includes a vessel having a metallic lining and a ceramic shell. There may be a gap between these materials, though this is optional. The lining may extend over the top of the shell or not. A base
15 plate may be provided, but is optional. The O-ring 11, fastener receiving or plastic plate 24, and pad 32 are also optional. In addition, the ceramic material (and the metallic material) may take many forms. The ceramic material, for example, may be molded, like any clay or
20 pottery item or blown like glass, etc. In addition, lips and/or ledges may be formed on the interior surface of the shell or on the exterior surface of the lining to seat and gap the lining.

 While the invention has been described in connection
25 with specific embodiments thereof, it will be understood that it is capable of further modification, and this application is intended to cover any variations, uses, or adaptations of the invention following, in general, the principles of the invention and including such departures
30 from the present disclosure as come within known or customary practice in the art to which the invention pertains and as may be applied to the essential features

hereinbefore set forth, and as fall within the scope of the invention and the limits of the appended claims.